

REMARKS

The present response is intended to be fully responsive to all points of rejection raised by the Examiner and is believed to place the application in condition for allowance. Favorable reconsideration and allowance of the application is respectfully requested.

Claims 1-6, 11-14, 17, 21, 24-49, 53-60, 63-64 are pending in this case. Claims 1, 5-6, 11-12, 21, 26-27, 36, 39-40 have been rejected under 35 U.S.C. § 112, second paragraph. Claim 55 has been objected to. Claims 1-6, 13-14, 17, 21, 24-27, 30-32, 34, 36-40, 43-45, 47, 49, 63-64 have been rejected under 35 U.S.C. § 102(b). Claims 11-12, 28-29, 33, 35, 41-42, 46, 48, 53-60 have been rejected under 35 U.S.C. § 103(a). Independent claims 1, 21, 36, 53 and 63 and dependent claims 2-6, 11-14, 24-27, 31, 37-40, 44, 55, 64 have been amended.

With respect to the Examiner's 35 U.S.C. § 103(a) rejections, Applicant has reviewed the cited art and respectfully submits that the art fails to disclose or suggest the Applicant's claimed invention. Therefore, Applicant respectfully traverses and requests favorable reconsideration.

Response to Claim Objections

The Examiner objected to claim 55. Applicant has amended claim 55 to clarify the operation of the optical multiplexer.

Response to 35 U.S.C. § 112, Second Paragraph Rejections

The Examiner rejected claims 1, 5-6, 11-12, 21, 26-27, 36, 39-40 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

Amended claims 1, 5-6, 11-12, 21, 26-27, 36, 39-40 now feature language which make it clear what the subject matter is that the Applicant regards as the invention. Applicant believes that amended claims 1, 5-6, 11-12, 21, 26-27, 36, 39-40 overcome the Examiner's rejection based on § 112, second paragraph grounds. The Examiner is respectfully requested to withdraw the § 112, second paragraph rejection.

Response to 35 U.S.C. § 102(b) Rejections

The Examiner rejected claims 1-6, 13-14, 17, 21, 24-27, 30-32, 34, 36-40, 43-45, 47, 49, 63-64 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,612,805 ("Fevrier et al."). Applicant respectfully submits that the prior art fails to disclose or suggest at least the step of filtering the input optical signals to remove the noise accumulation and to generate filtered optical

signals therefrom. Therefore, Applicant respectfully traverses the rejections and request favorable reconsideration.

Regarding representative claim 1, while continuing to traverse the Examiner's rejections, Applicant, in order to expedite the prosecution, has chosen to clarify and emphasize the crucial distinctions between the present invention and the devices of the patents cited by the Examiner. Specifically, representative claim 1 has been amended to include a method of optical network termination for removing noise accumulation in an optical network, the method comprising the steps of receiving over the optical network one or more input optical signals potentially corrupted with noise accumulation, filtering the one or more input optical signals so as to remove the noise accumulation and to generate one or more filtered optical signals therefrom and outputting the one or more filtered optical signals onto the optical network.

Fevrier et al. teaches an add-drop optical WDM multiplexer for dropping a drop multiplex from an incoming multiplex signal and for adding an add multiplex into an outgoing multiplex signal. The multiplexer includes a demultiplexing device for separating a number of optical carriers from the incoming multiplex signal and for selecting drop carriers that constitute the drop as well through carriers which are to be output as the outgoing multiplex signal. The multiplex further includes an apparatus for selecting a certain number of add carriers from the total number of carriers of the add multiplex, and a coupling device and wavelength converter for allocating fixed wavelengths to the signals which modulate the through carriers and the add carriers.

It is submitted that the add-drop multiplexer of Fevrier et al. (see Figure 3) comprises a $1 \times N$ optical decoupler (D1) at the input and an $N \times 1$ optical coupler C1 at the output. The individual tunable filters F^T making up the bank are individually controlled by control block MC1. The parameters of each of the filters can be tuned and set by the control block to any desired center frequency for the purpose of determining the wavelength of a particular channel among the N channels of the input multiplex ME input to the decoupler.

In contrast, the optical terminator of the present invention employs a multichannel optical filter adapted to filter the input optical signals to remove noise accumulation from the input signals. The noise having accumulated as the optical signals travel from node to node around the optical ring (in the case of a ring network). The filtering performed by the optical filter is for the purpose of removing the accumulated noise and not for the purpose of separating a number of optical carriers as in Fevrier et al. This feature is neither taught nor suggested by Fevrier et al.

Regarding representative claim 1, while continuing to traverse the Examiner's rejections, Applicant, in order to expedite the prosecution, has chosen to clarify and emphasize the crucial

distinctions between the present invention and the devices of the patents cited by the Examiner. Specifically, representative claim 21 has been amended to include an optical network terminator for removing accumulated noise from a wavelength division multiplexed (WDM) optical signal in an optical network comprising an optical demultiplexer operative to demultiplex WDM optical signal into individual optical channels having different wavelengths whereby accumulated noise in the WDM optical signal at the input to the optical demultiplexer is removed from the individual optical channels and an optical multiplexer optically coupled to the optical demultiplexer, the optical multiplexer operative to multiplex the individual optical channels to generate a filtered WDM optical signal therefrom with noise accumulation removed.

It is submitted, as stated hereinabove, the add-drop multiplexer of Fevrier et al. comprises a $1 \times N$ optical decoupler D1 at the input and an $N \times 1$ optical coupler C1 at the output. In contrast, the optical terminator of the present invention comprises an optical demultiplexer at the input and an optical multiplexer at the output. Unlike the add-drop multiplexer of Fevrier et al., the optical terminator of the present invention does not incorporate any tunable filters, switches, transmitters or receivers in its apparatus (see Figure 6). The output of the demultiplexer is coupled to the input of the multiplexer without intervening components. Further, an optical decoupler is significantly different in operation than a demultiplexer. Likewise, an optical coupler is significantly different in operation than a multiplexer. The filtering of the noise accumulation is performed by the demultiplexer in separating the input signal into individual channels each having a different wavelength. Along with separating the wavelengths in the input WDM signal, optical demultiplexer is operative to filter out any noise accumulation present in the signals of each individual channel. This feature is neither taught nor suggested by Fevrier et al.

Application as reviewed the cited art and respectfully submits that the art fails to disclose or suggest the Applicant's claimed invention, and fails to teach each and every element and limitation of the claims rejected herein. Therefore Applicant respectfully traverses the rejections and requests favorable reconsideration.

1-6, 13-14, 17, 21, 24-27, 30-32, 34, 36-40, 43-45, 47, 49, 63-64

It is believed that amended independent claims 1, 21, 36, 63 overcome the Examiner's § 102(b) rejection based on the Fevrier et al. reference. In addition, it is believed that amended dependent claims 2-6, 13-14, 17, 24-27, 30-32, 34, 37-40, 43-45, 47, 49, 64 also overcome the Examiner's rejection based on § 102(b) grounds. The Examiner is respectfully requested to withdraw the rejection based on § 102(b).

Response to 35 U.S.C. § 103(a) Rejections

The Examiner rejected claims 11-12, 28-29, 33, 35, 41-42, 46, 48, 53-60 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,594,046 ("Nishino"). Applicant respectfully submits that the prior art fails to disclose or suggest at least an optical network terminator that comprises an optical demultiplexer operative to demultiplex the WDM optical signal into individual optical channels having different wavelengths whereby noise accumulation in the WDM optical signal at the input to the optical demultiplexer is removed from the individual optical channels. Therefore, Applicant respectfully traverses the rejections and request favorable reconsideration.

While continuing to traverse the Examiner's rejections, Applicant, in order to expedite the prosecution, has chosen to clarify and emphasize the crucial distinctions between the present invention and the devices of the patents cited by the Examiner. Specifically, claim 1 has been amended to include an optical ring network comprising a plurality of nodes situated around the optical ring, wherein a portion of the nodes employs one or more optical amplifiers, an optical network terminator for removing noise accumulation from a wave division multiplexed (WDM) optical signal in the optical ring network, wherein the optical network terminator comprises an optical demultiplexer operative to demultiplex the WDM optical signal into individual optical channels having different wavelengths whereby noise accumulation in the WDM optical signal at the input to the optical demultiplexer is removed from the individual optical channels, a plurality of optical attenuators, each optical attenuator coupled in-line to an individual optical channel, the optical attenuator operative to vary the optical gain of an optical signal, a plurality of monitors, each monitor coupled in-line to an individual optical channel, the monitor operative to measure the optical power of an optical signal and an optical multiplexer optically coupled to the output of the plurality of monitors, the optical multiplexer operative to multiplex the individual optical channels to generate a filtered WDM optical signal therefrom with noise accumulation removed.

Nishino teaches a level flattening circuit for WDM optical signals. The circuit is supplied with a WDM optical signal and demultiplexes them into individual optical signals having different wavelengths, levels of which are separately feedback controlled to provide flattened optical signal levels. The stated purpose of the demultiplexer of Nishino is to separate the input signal into signals having different wavelengths.

In contrast, the purpose of the demultiplexer of the optical terminator of the present invention is to not only separate the input WDM signal into signals of different wavelengths but to remove the noise accumulation that has been added to the WDM optical signal as it travels around the optical

ring (in the case of an optical ring type network). This feature is neither taught nor suggested by Fevrier et al. or Nishino alone or in combination.

The combination of Fevrier et al. and Nishino would not result in the claimed invention. The Examiner has improperly combined Fevrier et al. and Nishino in an attempt to arrive at the claimed invention. The combination suggested by the Examiner fails to teach or suggest all the claims limitations. The combination of Fevrier et al. and Nishino fails to teach an optical demultiplexer operative to demultiplex the WDM optical signal into individual optical channels having different wavelengths whereby noise accumulation in the WDM optical signal at the input to the optical demultiplexer is removed from the individual optical channels.

Because Fevrier et al. and Nishino do not anticipate or suggest independent claims 1, 21, 36, 53, 63 as discussed above, then claims 11-12, 28-29, 33, 35, 41-42, 46, 48, 54-60 are allowable as well. The Applicant respectfully traverses the objections of claims 11-12, 28-29, 33, 35, 41-42, 46, 48, 53-60 and submits that the presently claimed invention is patently distinct over Fevrier et al. in view of Nishino. The Examiner is respectfully requested to withdraw the rejection based on § 103(a).

Conclusion

In view of the above amendments and remarks, it is respectfully submitted that independent claims 1, 21, 36, 53, 63 and hence dependent claims 2-6, 11-14, 17-20, 24-35, 37-49, 54-60, 64 are now in condition for allowance. Prompt notice of allowance is respectfully solicited.

In light of the Amendments and the arguments set forth above, Applicant earnestly believes that they are entitled to a letters patent, and respectively solicit the Examiner to expedite prosecution of this patent applications to issuance. Should the Examiner have any questions, the Examiner is encouraged to telephone the undersigned.

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Respectfully submitted,

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